MARSHALL STAR

Marshall Space Flight Center — August 12, 1999

"We bring people to space — We bring space to people"

Chandra reaches final orbit, activation begins

Compiled from Marshall and TRW news releases

Controllers at NASA's Chandra X-ray Observatory Operations Control Center in Cambridge, Mass., last weekend opened a protective door on one of the observatory's key science instruments, confirmed that Chandra is in its appropriate final operating orbit, and deactivated its Integral Propulsion System.

"We're moving right along," said NASA's Chandra Program Manager Fred Wojtalik of the Marshall Center. "Everything continues to go extremely well with activation of the world's most powerful X-ray telescope."

Following a pre-planned series of

*See **Chandra** on page 5*

Photo by Doug Stoffer

Welcome teachers

1999 National Teacher of the Year Andy Baumgartner of Augusta, Ga., left, and Marshall Center Director Art Stephenson, right, participate in opening ceremonies for International Space Camp held July 31-Aug. 6 at the U.S. Space & Rocket Center. Teachers and students from across the United States and approximately 30 countries attended the annual event. The event has been hosted by Marshall's Education Programs Office since 1993.

Marshall, SUMMA Technology Inc. sign $11 million contract for Fastrac engine flight program

by Martin Burkey

Marshall and SUMMA Technology Inc. of Huntsville recently signed a contract for manufacturing, operations and maintenance of the Fastrac rocket engine in support of X-34 rocket plane test flights and potential commercialization of the engine.

The 28-month competitively-awarded contract calls for SUMMA to build three new Fastrac flight engines for the X-34 technology demonstrator and utilize one additional flight engine already under contract.

This contract will cover engine hardware, engineering support and refurbishment for 22 planned powered flights of the X-34, which was officially rolled out in April. Total value of the contract, including options, is almost $11.3 million.

The contract also includes: engine hot-fire acceptance testing at NASA's Stennis Space Center, Miss., logistics and spare parts, monitoring engine performance during and after test flights, post-flight engine inspection, and other tasks in support of X-34 flights.

Under a pending separate licensing agreement, the company will seek other markets for the engine beyond the X-34 program. The U.S. government would receive royalties for engines sold commercially.

"Keys to the success of this effort will be providing quality engine hardware on time, rigorous cost control, thorough certification of engine flight readiness, and the flexibility to respond to changes in a timely manner," said Jimmy Lee, manager of the Fastrac manufacturing, operations and maintenance contract for the Marshall Center.

The 60,000-pound-thrust engine was designed and developed by the Marshall Center.

There will be an initial six-month transition phase during which the Marshall Center will turn over all blueprints, test data and other material needed for SUMMA Technology to assume responsi-

*See **Fastrac** on page 4*

"Safety is Everybody's Business"
— Safety slogan submitted by ***Richard Smith, HEI***

Rogacki named director of Space Transportation Directorate

by Rick Smith

Dr. John R. (Row) Rogacki has been named director of the new Space Transportation Directorate at Marshall. The directorate is a key element created in a recent reorganization of the Center.

Rogacki, a 26-year U.S. Air Force veteran, was director of the Propulsion Directorate at Phillips Laboratory at Edwards Air Force Base, Calif., before he was appointed to the Marshall directorate. During his tenure at Phillips, he spearheaded design and delivery of space and missile propulsion technologies.

A native of Harrison, N.J., Rogacki is a 1973 graduate of the Air Force Academy in Colorado Springs, Colo. He earned a master's degree in mechanical engineering in 1983 and a doctorate in mechanical engineering in 1992 — both from the University of Washington in Seattle.

While serving on active duty in the Air Force, Rogacki logged more than 3,000 flight hours as a command pilot in aircraft ranging from motorized gliders to heavy bombers. From 1985 to 1987, he served as chief of the B-52 Branch, Standardization and Evaluation Division, 42nd Bomb Wing, stationed at Loring Air Force Base in Maine.

Dr. John R. (Row) Rogacki

Rogacki returned to the Air Force Academy in 1987 as associate professor of engineering mechanics and chief of the Materials Division. During his tenure, he gained the distinction of being the first American engineer and military officer to lecture at Moscow State Technical University since the start of the Cold War.

In 1993, Rogacki joined Wright Laboratory at Wright-Patterson Air Force Base, Ohio, serving as chief of the Structures Division and managing nearly all the Air Force's fixed-wing aircraft structural research and development. He advanced in 1995 to deputy director of the Flight Dynamic Directorate at Wright Laboratory, where he was responsible for orchestrating research and development in flight control, aeromechanics and other core areas.

Rogacki, his wife Wanda and their children, Janina and John, will reside in Madison, Ala.

The writer, a contractor employed by ASRI, supports the Media Relations Department.

Marshall Values

Employees strive to exceed internal, external customer expectations

Editor's note: *This is the second in a five-part series addressing Marshall's core values.*

The Marshall team is committed to five core values: People, Customers, Excellence, Teamwork and Innovation. These values serve as the principles that guide our decisions and behaviors. This week the Star looks at the value of customers. Sally Little, manager of Marshall's Technology Transfer Department, discusses who Marshall's customers are, how Marshall employees serve customers and why that is important.

CUSTOMERS:

• We are accountable to our customers and are committed to their satisfaction.

• Our customers can depend on us to deliver quality products and services.

Before talking about customers, we have to first identify that we have internal, external and ultimate customers, Little said.

"Our ultimate customers are the American people, both current and future generations. Understanding this drives every choice we make on a daily basis. We invest in doing the right things today, which serve our existing external and internal customers and also address the needs of our new customers who are not yet born."

While the obvious mission of NASA is space exploration, spinoff technologies are adapted for use on Earth, thereby improving the quality of life for humankind.

"We do more than explore the heavens at NASA," Little said. "We boost the U.S. economy and improve the quality of life on Earth. We give kids something worthwhile to dream about. NASA is a vital investment in learning about our awesome universe and in delivering benefits to every aspect of life on our home planet. The technologies we need to reach the stars are the engines to drive America's future."

She said staying attuned to the needs of specific customers as products and services are developed involves maintaining open, honest, two-way communication with the customers.

"Each person in the Marshall family has a unique contribution to make in helping NASA deliver on its highest potential for serving our nation's future," Little said. "In many respects, every relationship we have with a customer is really a partnership of creating, negotiating and satisfying expectations. The ultimate fulfillment of our core value is wowing our customers by giving them more than they ask."

When we listen deeply, explore creatively, innovate passionately and deliver excellently, we build a lasting partnership of trust with our customers and enhance our opportunities to make even greater contributions in the future, she said.

Key Personnel Announcements

Dr. Paul M. Munafo has been named deputy director of the Materials and Processes Department of the Engineering Directorate. Prior to this appointment, Munafo served as chief of the Materials and Processes Department, Engineering Directorate.

Dr. Paul M. Munafo

Munafo spent the early years of his career with the Boeing Company and Chrysler Corporation Space Division, prime contractor for the Saturn S-1C and S-1B stages. During that time, he developed a strong rapport with NASA and joined the Agency in 1975.

He has held positions of increasing technical and managerial responsibility at Marshall, including team leader of the Mechanical Metallurgy, Materials and Processes Laboratory, and chief of the Metallurgical and Failure Analysis Branch.

Among his many administrative accomplishments at Marshall, he has established a capability for hardware failure analysis that is foremost of its kind in the nation.

He earned a bachelor of science degree in mechanical engineering at Massachusetts Institute of Technology in Cambridge, Mass., in1963. He subsequently earned a master of science degree from Tulane University in New Orleans in 1971, and a doctorate from Auburn University in 1996 in mechanical engineering, specializing in materials science. He has received two NASA Medals for Exceptional Achievement, along with numerous other NASA awards.

Dr. Dominic A. Amatore has been named manager of Marshall's Media Relations Department. He replaces John B. Taylor, who now is serving on the staff of the Customer and Employee Relations Directorate.

Amatore had been deputy manager of Media Relations since April 1998. He came to Marshall in 1986 from the U.S. Army Test & Evaluation Command headquartered at Aberdeen Proving Ground, Md., where he was the deputy public affairs officer.

At Marshall he has served in several positions, including deputy director of the Public Affairs Office. During his tenure at Marshall, he has been instrumental in conducting media activities for every major undertaking of the Center, including the redesign of the Space Shuttle solid rocket motors; the return to flight of the Shuttle in 1988; development, launch and operation of the Hubble Space Telescope; Spacelab missions; development and testing of the Clipper Graham, X-33 and X-34 technology demonstrators; and development and launch of the Chandra X-Ray Observatory.

Amatore's government career began in 1976 with the Army Missile Command at Redstone Arsenal, Ala., and included positions with the Army Corps of Engineers in Mobile, Ala., and the Defense Logistics Agency in Dayton, Ohio. He is a bachelor of arts graduate of Colgate University in Hamilton, N.Y., and earned a doctorate in English from Tulane University in New Orleans. He also attended the graduate school of business at Ohio State University in Columbus. In 1997 he received the NASA Exceptional Service Medal.

Dr. Dominic Amatore

He and his wife Janet reside in Madison, Ala. They have two grown children, Dominic of New York City; and Theresa, a student at Colorado State University, Fort Collins, Colo. Amatore is the son of Helen Amatore of Youngstown, Ohio.

Fireworks in the sky

Perseid meteor shower viewable Friday on Website

The Perseid Meteor Shower will peak on Friday. Activity should be high for a 24-hour period beginning at approximately 2 p.m. on Thursday. Amateur astronomers should be able to view the shower in the early morning hours Friday in Alabama.

Scientists from Marshall's Space Sciences Department will launch a weather balloon to 100,000 feet at 2 a.m. CDT Friday. The balloon will carry a digital camera that will provide a clearer view of the Perseids Meteor Shower.

The Perseids meteors are leftover rubble from the comet Swift-Tuttle. The meteors streak across the sky, sometimes exploding as multicolored fireballs as they burn up in the Earth's atmosphere.

Scientific experiments will be carried on the balloon in an attempt to collect particles from the stratosphere during the meteor shower, some possibly from the Perseids themselves. Several different types of capture media and devices will be employed.

Continuous video imags of the meteors from the on-board camera will be available online at the Space Sciences Website at:
http://www.perseidslive.com

Marshall Child Development Center has openings for toddlers and 3-year-olds

by Debra Valine

For working parents, sometimes the hardest part about having a family is finding convenient, affordable day care.

Marshall employees and contractors need look no farther than the Marshall Child Development Center in Bldg. 4494. The center is nonprofit, and run by employees for employees.

Since 1989, it has been operated by a parent-elected board that holds elections every one or two years, depending on the elected position. NASA furnishes the building, utilities, the Website and some general equipment.

"The Marshall Child Development Center is open to children of NASA employees and on-site contractors," said Shawna Broussard, the center's vice president. "If parents already have a child in the center, that child's siblings have first priority for openings. The enrollment priority is then children of Marshall civil service employees and Marshall Child Development Center employees, then NASA retirees and then on-site contractors. Our facility can accommodate up to 124 children from ages 6 weeks to kindergarten age."

The center currently has openings in the toddler — 1-to-2 year olds — and 3-year-old classes. Daily curricula involve academic and social development classes to prepare the children for kindergarten.

The Child Development Center is in the process of becoming accredited by the National Association for the Education of Young Children to meet President Clinton's mandate that all child development centers on federal property be accredited by 2000.

"To become accredited, we must meet the guidelines set forth by the National Association; these include implementing lower student to child caregiver ratios and a new curriculum to ensure age appropriate activities," said Broussard, who works as an environmental test engineer in Microgravity Research. "The guidelines set forth by this organization are very stringent."

Several of the child caregivers at the Development Center hold degrees or certificates in child development. "We are in the process of setting up on-site training for those teachers who do not have degrees or certificates in child development," Broussard said. "We also hold workshops in subjects like cardio-pulmonary resuscitation and how to recognize signs of child abuse. Proper training of our staff is a very important factor in our accreditation process."

The center is open from 6:45 a.m.-5:45 p.m. daily. Each child is provided breakfast, lunch and an afternoon snack. For more information about the center, call 544-8607 or visit the Website at:

http://www1.msfc.nasa.gov/MCDC/

The writer, a contractor employed by ASRI, is the Marshall Star editor.

Photo by Doug Stoffer

Center Director Art Stephenson, left, and Center Operations Director Sheila Cloud, right, visit children at the Marshall Child Development Center recently.

Fastrac

Continued from page 1

bility for the engineering and subcontracting roles performed by NASA engineers during the design and development program, Lee said.

The Fastrac program began in 1996. Under two earlier contracts to the Marshall Center, SUMMA Technology has built four development engines and now is building two flight engines.

The Fastrac engine development and flight certification program will continue in parallel with the manufacturing, operations and maintenance contract.

The Fastrac engine is designed to be cheaper to build and operate than existing rocket engines. The air-launched X-34 will demonstrate technologies and operations that could cut launch costs from $10,000 per pound today to $1,000 per pound. Unpowered flight tests are expected to begin this year.

The writer, a contractor employed by ASRI, supports the Media Relations Department.

Upcoming Events

TFAWS '99 Workshop — The Tenth Thermal & Fluids Analysis Workshop (TFAWS '99) will be held Sept. 13-17 at the Bevill Center in Huntsville. Marshall is hosting the event. The workshop will focus on applications of thermal and fluids analysis in the aerospace field. The workshop will bring industry, academia and government together to share information and exchange ideas about applications analysis tools and methods. To register, visit the Web at: http://tfaws99.msfc.nasa.gov

Shuttle Replacement Technology Team Meeting — The Shuttle Replacement Technology Team will meet Aug. 31-Sept. 1 from 8 a.m.-5 p.m. at Bldg. 4203, room 1201. The meeting will provide Shuttle elements, equipment manufacturers and NASA personnel an opportunity to present and discuss measures being taken in eliminating ozone depleting chemicals and hazardous air pollutants. Elements to be discussed include the external tank, orbiter, reusable solid rocket motors, solid rocket booster and Space Shuttle main engine. Equipment to be discussed includes extra-vehicular equipment activities such as space suits, maneuvering units, etc. Changes to Environmental Protection Agency regulations affecting these items also will be discussed. Anyone interested in the topics to be presented and discussed may attend. For more information, call Vaughn Yost at 544-1998 or e-mail at vaughn.yost@msfc.nasa.gov

Information Technology Security Awareness Training — Mandatory information technology security awareness training will be held Aug. 25 and Aug. 26 from 9-10 a.m. in Morris Auditorium. Annual information technology security basic awareness training is required for all Marshall employees and on-site contractors. Copies of the instructional CD-ROM used in the briefing will be distributed or use in training and reporting employee participation for documentation of the FY99 training. For more information, call Steve Jones at 544-4373.

Women's Equality Day Luncheon — The annual Women's Equality Day luncheon will be held Aug. 26 at 11 a.m. at the Redstone Arsenal Club. The event is hosted by the Federal Women's Program Managers from Marshall, Office of Personnel Management, U.S. Army Aviation & Missile Command, Defense Intelligence Agency, and the U.S. Army Space and Missile Defense Command. Jean Warren, director of Huntsville's Broadway Theatre League, will speak. Awards will be presented to outstanding women achievers in clerical, business and engineering/science from each sponsoring agency. Each agency will recognize one supervisor/manager for exceptional support and recognition of women's contributions. Luncheon tickets, at $8.50, may be purchased from Billie Swinford, Bldg. 4200, room 220. For more information, call 544-0087.

Chandra

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commands from the flight operations team in Cambridge, the Advanced Charge-Coupled-Device Imaging Spectrometer door opened at 5:46 p.m. CDT Sunday. Opening the door cleared the way for additional activation and testing of the instrument which will be used to take Chandra's first images around the first of September.

Meanwhile, controllers continue activation and checkout of the observatory's science instruments and have begun the process of replacing the early mission flight software in Chandra's on-board computers with software that will be used in the operational phase of the mission.

Over the last two weeks, the 45-foot-long TRW-built Chandra has used five engine firings of its Integral Propulsion System to propel itself from a temporary transfer orbit, where it was placed by an Inertial Upper Stage, to a highly elliptical Earth orbit that extends more than one-third the distance to the Moon. The final burn, which lasted about 8 minutes, was completed on Aug. 7 at 12:46 a.m. CDT. It placed Chandra in an orbit that measures approximately 6,000 miles by 86,300 miles, a variation of less than 1 percent from its target orbit. The observatory will now orbit the Earth about once every 63.5 hours.

Over the next five years, Chandra will use the world's most powerful X-ray telescope to probe the mysteries of a universe that cannot be seen by the human eye or conventional optical telescopes. Its array of exquisitely polished and aligned mirrors will allow X-ray astronomers to produce previously unattainable images of celestial phenomena such as quasars, black holes, remnants of exploding stars and clouds of multi-million degree gas that comprise clusters of galaxies.

Chandra, the third in NASA's family of Great Observatories that includes the Hubble Space Telescope and the TRW-built Compton Gamma Ray Observatory, was launched from Kennedy Space Center, Fla., aboard the Space Shuttle Columbia at 11:31 p.m. CDT on July 22. Approximately seven hours after launch, it was deployed from the Shuttle approximately 146 miles above the Earth attached to the Inertial Upper Stage. After two burns of the Inertial Upper Stage, which placed it in an orbit measuring approximately 206 miles by 45,000 miles, Chandra deployed its 64-foot-span solar panels, then separated successfully from the Inertial Upper Stage.

TRW has been designing and producing spacecraft for NASA's most challenging space science missions for more than 40 years. In addition to Chandra, the company is currently developing designs and technologies for several of NASA's future space astronomy missions, including the Space Interferometry Mission, the Next Generation Space Telescope, which are both part of NASA's Origins program, and Constellation-X, the successor mission to Chandra.

To follow Chandra's progress, visit the Chandra News Web site at:

http://chandra.nasa.gov

Scientists prepare for a 'virtual' voyage into space

by Kelly McFalls

Science teams around the world are poised for an exciting voyage into space — to boldly go beyond the limits of gravity in search of ways to improve life on Earth.

These trekkers represent a new breed of "virtual" researchers who will conduct fundamental, groundbreaking science aboard the International Space Station without leaving home. They'll use a tool known as the Telescience Resource Kit, or TReK — a new computer software system that enables scientists to remotely operate their Space Station experiments from anywhere in the world.

"As we move into the Space Station era and round-the-clock, long-duration science operations in space, it's not practical or feasible to have science teams on site," said Michelle Schneider, who leads the team of Marshall engineers who developed TReK.

The idea behind TReK is to make it easy for science teams working in their own laboratories on Earth to receive information from and transmit commands to their experiments aboard the Space Station 220 miles in space. "TReK is a user-friendly, PC-based system," said Schneider. "PC advancements — processing power, memory and networking capabilities — enable PCs to support this system."

TReK uses off-the-shelf computer hardware and software, which makes it cost-effective for users. "We didn't want to reinvent the wheel if what we needed was already out there," said Schneider. "We provide users with TReK, the non-commercial software, and a list of suggested hardware — basically, any PC — and software that is readily available."

TReK works by receiving and relaying information to the main computer system in the Science Operations Center at Marshall. Science teams will specify what information they want to obtain from their experiments and in what intervals. Once the experiment is under way, the main computer system in the Operations Center retrieves the requested information and routes it to the TReK system. TReK processes and displays the information for the science teams. In turn, science teams can send information through TReK to the main computer system which relays it to the experiment.

With TReK, nearly all Space Station science operations can be remote. "It has the capability to support most of the experiments conducted aboard the Space Station," said Schneider. "We could have as many remote sites as we have science teams."

Science teams are now getting a first-look at the system and seem pleased. "Remote-site testing has begun," said Schneider, "allowing users to get a feel for the product and allowing us to get some initial, positive feedback from users." The first delivery of TReK is expected to be fully operational next summer.

The first Space Station experiments planned for installation on the orbiting laboratory are scheduled for launch in 2000. Assembly of the International Space Station began last December when the Endeavour Space Shuttle mission attached together in orbit the first two station modules.

The writer, a contractor employed by ASRI, supports the Media Relations Department.

Photo by Dennis Keim

Space Flight Awareness Award

The Space Flight Awareness Leadership Award is presented to Charles Scales, manager of Marshall's Equal Opportunity Office, at the recent launch of Space Shuttle Columbia. On hand for the presentation are, from left, astronaut Charles J. Precourt, Charles Scales, Center Director Art Stephenson, and astronaut Frank Caldeiro.

Job Opportunities

CPP 99-41-CP, Supv AST, Optical Physics, GS-1310-15, Science Directorate, Diffractive Optics, Coating and Surface Metrology Diffractive Optics Development Group, Space Optics Manufacturing Technology Center. Closes Aug. 13.

CPP 99-63-CP, Supv AST, Flight Systems Test, GS-861-15, Science Directorate, Microgravity Science & Applications Department, Systems Test Group. Closes Aug. 18.

CPP 99-64-CP, Management Support Officer, GS-301-12, Science Directorate, Business Management Office. Closes Aug. 18.

CPP 99-65-CP, AST, Optical Physics, GS-1310-14, Science Directorate, Optical Design, Analysis, and Fabrication Group, Space Optics Manufacturing Technology Center. Closes Aug. 13.

CPP 99-66-CP, AST, Optical Physics, GS-1310-14, Science Directorate, Diffractive Optics, Coatings and Surface Metrology Diffractive Optics Development Group, Space Optics Manufacturing Technology Center. Closes Aug. 13.

CPP 99-67-MB, AST, Electronics of Materials, GS-1310-14, Engineering Directorate, Avionics Department, EEE Parts and Packaging Group. Closes Aug. 18.

CPP 99-68-MB, AST, Data Systems, GS-854-14, Engineering Directorate, Avionics Department, Simulation Group. Closes Aug. 18.

CPP 99-69-MB, AST, Navigation, Guidance, and Control Systems, GS-861-14, Engineering Directorate, Avionics Department, Control Electronics Group. Closes Aug. 18.

CPP 99-70-MB, AST, Electrical Systems, GS-850-14, Engineering Directorate, Avionics Department, Avionics Systems Group. Closes Aug. 18.

CPP 99-71-RE, Supv AST, Technical Management, GS-801-14/15, Space Transportation Directorate, X-33 Program Office. Closes Aug. 27.

CPP 99-72-MB, AST, Electromagnetics Systems, GS-855-14, Engineering Directorate, Avionics Department, Radio Frequency Group. Closes Aug. 18.

CPP 99-73-MB, AST, Electronic Instrumentation Systems, GS-855-14, Engineering Directorate, Avionics Department, Instrumentation and Control Group. Closes Aug. 18.

CPP 99-74-MB, AST, Data Systems, GS-854-14, Engineering Directorate, Avionics Department, Flight Software Group. Closes Aug. 18.

CPP 99-75-MB, AST, Electronics of Materials, GS-1310-14, Engineering Directorate, Avionics Department, EEE Parts & Packaging Group. Closes Aug. 18.

CPP 99-76-CL, AST, Telemetry Systems, GS-855-14, Engineering Directorate, Engineering Systems Department, Environments Group. Closes Aug. 18.

CPP 99-77-CL, AST, Manned Systems, GS-801-14, Engineering Directorate, Engineering Systems Department, Systems Engineering Support Group. Closes Aug. 18.

CPP 99-78-KP, AST, Structural Mechanics, GS-861-14, Engineering Directorate, Structures, Mechanics, & Thermal Department, Strength Analysis Group. Closes Aug. 18.

CPP 99-80-CV, AST, Flight Activity Planning (2 Vacancies), GS-801-14, Flight Projects Directorate, Payload Operations & Integration Department. Closes Aug. 18.

CPP 99-81-CV, AST, Mission Support Requirements and Development, GS-801-14, Flight Projects Directorate, Payload Operations & Integration Department, Operations Training Group. Closes Aug. 18.

CPP 99-82-CP, Program Analyst, GS-343-13, Science Directorate, Business Management Office, Resources Group. Closes Aug. 24.

CPP 99-83-CL, AST, Technical Resources Management, GS-801-14, Engineering Directorate, Business Management Office. Closes Aug. 24.

CPP 99-84-CV, AST, Aerospace Flight Systems, GS-861-14, Flight Projects Directorate, Flight Systems Department, ECLSS Group. Closes Aug. 18.

CPP 99-85-CL, AST, Structural Materials, GS-806-14, Engineering Directorate, Materials, Processes, and Manufacturing Department, Chemistry Group. Closes Aug. 18.

CPP 99-88-JB, Supv AST, Advanced Technology Program Management, GS-801-15, Space Transportation Directorate, Advanced Space Transportation Programs Office. Closes Aug. 18.

CPP 99-89-RE, AST, Advanced Technology Program Management, GS-801-15, Space Transportation Directorate, ISS Propulsion Module Project Office. Closes Aug. 18.

CPP 99-90-CV, AST, Aerospace Flight Systems, GS-861-14, Flight Projects Directorate, Flight Systems Department, ECLSS Group. Closes Aug. 18.

CPP 99-91-CV, AST, Aerospace Flight Systems, GS-861-14, Flight Projects Directorate, Flight Systems Department, ECLSS Group. Closes Aug. 18.

CPP 99-92-CL, AST, Aerospace Flight Systems, GS-861-14, Engineering Directorate, Engineering Technology Development Office. Closes Aug. 18.

CPP 99-93-MB, AST, Electrical Power Systems, GS-850-14, Engineering Directorate, Avionics Department, Electrical Power Group. Closes Aug. 18.

CPP 99-95-RE, AST, Aerospace Metallic Materials, GS-806-14, Engineering Directorate, Materials, Processes, & Manufacturing Department, Metallic Materials & Processes Group. Closes Aug. 18.

CPP 99-96-CV, AST, Mission Operations Integration, GS-801-14, Flight Projects Directorate, Payload Operations & Integration Department. Closes Aug. 24.

CPP 99-97-CP, AST, Aerospace Flight Systems, GS-861-15, Science Directorate, Office of the Director. Closes Aug. 24.

CPP 99-98-JB, Supervisory Contract Specialist, GS-1102-15, Procurement Office. Closes Aug. 18.

Reassignment Bulletin: 99-12-CP, Program Analyst, GS-343-12, Science Directorate, Business Management Office. Closes Aug. 20.

Reassignment Bulletin: 99-13-CV, AST, Mission Operations Integration, GS-801-13. (2 vacancies). Flight Projects Directorate, Payload Operations and Integration Department, Payload Operations Directors Group. Closes Aug. 12.

Reassignment Bulletin: 99-14-CV, AST, Manned Systems, GS-801-12/13, Flight Projects Directorate, Payload Operations and Integration Department, Operations Training Group. Closes Aug. 20.

Reassignment Bulletin: 99-15-CV, AST, Data Systems, GS-854-12/13 (3 vacancies). Flight Projects Directorate, Payload Operations and Integration Department, Payload Systems Group. Closes Aug. 20.

Obituary

Fritz, Stephen R., 45, died Aug. 8 in Guntersville. At the time of his death, Fritz was a contract employee with Electronics Technician/Cortez III. He worked at Marshall from 1982-1999. He is survived by his mother, a sister and a brother.

Employee Ads

Miscellaneous

★ Washer & dryer, 3 years old, $250; toddler bed with mattress, $15. 771-2911
★ Oak bedroom suite, four-poster queen bed, mattress, box spring, nightstand, dresser, mirror, $700 obo. 534-3783
★ Queen-size sofa bed, plaid, $175. 881-0354
★ Hypertech programmer for Chevy and GMC trucks, 96-97, $250. 882-9407
★ Antique buffet, very nice. 837-0085
★ Clayton Marcus couch, off-white w/lt. blue, pink and green floral print, $450. 259-1834
★ All-steel boat trailer, 14', and 11' Jon boat, extras thrown in, $500 obo. 650-0518
★ Beer brewing equipment $75; 5 speakers, $25; pasta machine, $15; full bed, $75. 723-2898
★ Push lawn mower, 3HP motor, side discharge, $40. 883-9361
★ Screw mount lenses Vivitar 135mm manual, 200mm auto, Fujinon, 55mm auto, 3X teleconverter, $50. 837-2836
★ Monerai sailplane kit, partially completed, sell for best offer. 534-8186
★ 1993 Innsbruck self-contained travel trailer, 21', a/c, all appliances, cover, $6,750. 852-5394
★ Gooseneck horse trailer, 20', tack/dressing room, $2,850; flat bed trailer, 18', bumper pull, $1,350. 931-732-4742
★ Electric clothes dryer; 6-leg children's swing set; $95 each. 881-6040
★ 1998 Kawasaki Vulcan 800 motorcycle, 3K miles, windshield, saddle bags, backrests (2), warranty, $5,200. 837-6109
★ Two Fisher Price Power Wheels with batteries and chargers, $65 ea. 890-0768
★ Solid oak corner entertainment center and matching bookcase, custom made, $975. 851-6661
★ Bathtubs, mobile home, 54x27, $60; 54x40 garden tub, $90; 2 yrs. old. 423-7126

Vehicles

★ 1991 Mitsubishi Colt Vista, 4-wheel drive, 7-passenger, 2-tone paint, garage kept, $4,995. 883-7348
★ 1997 Mitsubishi Eclipse GS, black, sunroof, leather, keyless entry, alloy wheels, 6-CD changer, 47K miles, $14,400. 990-2050
★ 1995 Nissan 200SX, 37,500 miles, sunroof, spoiler, 5-speed, A/C, cruise, power doors/windows, $8,500. 880-7376
★ 1988 Mercury Sable wagon, LX, 3.8L, $500+ in new parts, $2,100 obo. 828-6213
★ 1988 Chrysler LeBaron convertible, yellow w/tan top, 2.2 litre turbo engine, $2,150. 778-9149
★ 1993 Saturn SC2, white 99K miles, PS/PB/AC/SR, cruise, AM/FM cassette, $5,500. 232-1173
★ 1992 Nissan 300ZX, white, 5-speed, T-tops, 87K miles, $12,900. 883-0427
★ 1994 Pontiac Trans Port SE van, V-6 engine, loaded, front and rear air, white w/gray interior, 73K miles, $8,900. 350-5613
★ 1990 Dodge Dakota Sport, 149K miles, new battery, waterpump, tune-up, transmission service, $4,400 obo. 837-6109
★ 1997 Taurus SHO, automatic, CD changer, leather, moonroof, spoiler, 36K miles, $18,000 obo. 353-6358
★ 1995 Pontiac Bonneville SE, silver w/charcoal leather, all power, CD, auto leveler, one-owner, $9,995. 883-4677

Free

★ Male, purebred Brittany Spaniel, approx. 2 yrs. old. 353-4172
★ Cocker Spaniel, buff, male, age 11, neutered, shots current, good health. 851-6661

Wanted

★ Two Alabama football tickets against Houston, Arkansas, Tennessee, or LSU. 461-9662/ask for Teresa.
★ 1995 Corvette service manual. 650-0742
★ Steel scaffolding. 881-6040

Found

★ Electronic memo pad, East parking lot of Bldg. 4663. 961-2239 to identify
★ Ledger book, Bldg. 4200. Call 544-4758

Lost

★ Car keys, Bldg. 4202. Call 544-4758.

Center Announcements

☞ ***Rocket City Rowing Club —*** The Rocket City Rowing Club is offerring a rowing clinic for adult beginners on Saturday, Sept. 11, 18, 13, and Oct. 2, from 10 a.m.-noon. The clinic teaches basic rowing technique, along with equipment and basic lingo. Cost is $60. To sign up, call Halley Little at (256) 539-8841.

☞ ***Shuttle Buddies Breakfast —*** The Shuttle Buddies will meet for breakfast at 9 a.m., Monday, Aug. 23, at Shoney's on University Drive West. For more information, call Deemer Self at 881-7757, or Gail Wynn at 852-8189.

☞ ***NARFE Meeting —*** The National Association of Retired Federal Employees (NARFE) will meet Saturday at the Senior Center on Drake Avenue. Mike Goodman of the Redstone Federal Credit Union will review many of the services offered by the credit union, highlighting those designed for senior citizens. Refreshments at 9:30 a.m.; program starts at 10. For more information, call 837-0382 or 881-3168.

☞ ***MARS Tennis Club —*** On Saturday the MARS Tennis Club will hold a Women's Open Doubles Tournament. The tournament starts at 8:30 a.m., with check-in and warm-up at 8 a.m. Call Amy Hemken at 544-7097 with doubles team names. Guest fee is $3.

☞ ***Disney Vacation Special —*** Special T Travel of Orlando, Fla., is offering a four-day, three-night Disney/Epcot Area Hotel package especially for Marshall employees, retirees and on-site contractors for only $169. The price includes hotel accommodations for two adults and up to two children (up to 12 years of age). Room tax is not included. To take advantage of this exclusive offer, a deposit of $95 must be made by Aug. 27, but travel dates are good for one full year. For more information, call Special T Travel at 800-393-3191. The NASA Exchange account reference is TC-9207. Flyers are available at the Marshall Activities Building, 4752.

☞ ***NASA Ski Week*** — The 9th Annual NASA Ski Week will be hosted at Big Sky, Mont., Jan. 22-29, 2000. Skiers from eight NASA centers will gather at this 3,500-acre resort for camaraderie and winter sports. For information, call 1-233-0705 or e-mail Thomas.S.Dollman@msfc.nasa.gov

☞ ***MARS Flag Football —*** Marshall employees and on-site contractors can sign-up to play men's and women's flag football by calling Len Bell at 544-6724 or send e-mail to: len.bell@msfc.nasa.gov

☞ ***Redstone Toastmasters —*** Do you want to improve your speech? Visit and join Redstone Toastmasters, which meets weekly at 6 p.m. on Tuesday at Piccadilly Cafeteria in Madison Square Mall. For more information, call Joe Jones at 461-0476.

☞ ***Lunar Nooners Toastmasters —*** The NASA Lunar Nooners Toastmasters Club meets Tuesday at 11:30 a.m. in Bldg. 4610 cafeteria conference room. For more information, call Lee Johns at 544-5142.

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